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FACT SHEET

Minotaur V

High Energy Space Launch Vehicle

Minotaur V provides cost-effective support of small GEO and lunar missions

Overview

Minotaur V is a 5-stage evolutionary version of the Minotaur IV Space Launch Vehicle (SLV) to provide an extremely cost-effective capability to launch US government sponsored small spacecraft into high energy trajectories, including Geosynchronous Transfer Orbits (GTO) as well as translunar and beyond. The Minotaur V concept leverages Orbital's flight proven heritage of the Minotaur family of launch vehicles, as well as the commercial Pegasus and Taurus SLVs, to create a low-risk, readily-developed system.

The Minotaur V avionics, structures, and fairing are common with the Minotaur IV SLV, with relatively minor changes to create the five stage configuration. Moreover, the avionics and flight software are highly common across all Minotaur family vehicles.

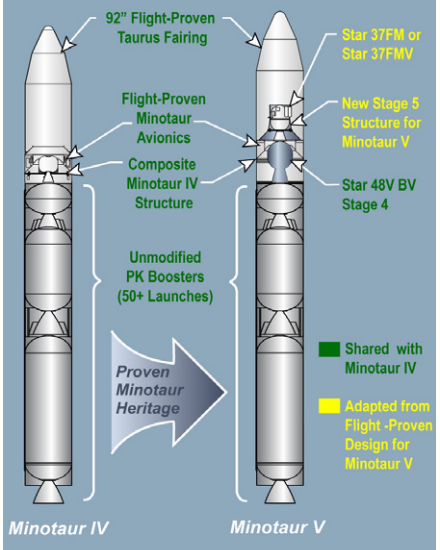
The first three stages of the Minotaur V are former Peacekeeper solid rocket motors with over 50 flights of each stage. The fourth and fifth stages are commercial motors that can be selected to provide varying levels of performance. The stage four motor is a Star 48V configuration. The fifth stage can be either attitude controlled or spinning. For a spin-stabilized upper stage, a Star 37FM is used to provide maximum performance. A Star 37FMV, with gimballed, flexseal nozzle, is used for 3-axis stabilized control.

The Minotaur family of launch vehicles are provided via the Orbital/Suborbital Program 2 (OSP-2) and managed by the U.S. Air Force Space and Missile Systems Center (SMC), Space Development and Test Wing's (SDTW) Launch Test Squadron (LTS) located at Kirtland AFB, NM.

QUICK FACTS:

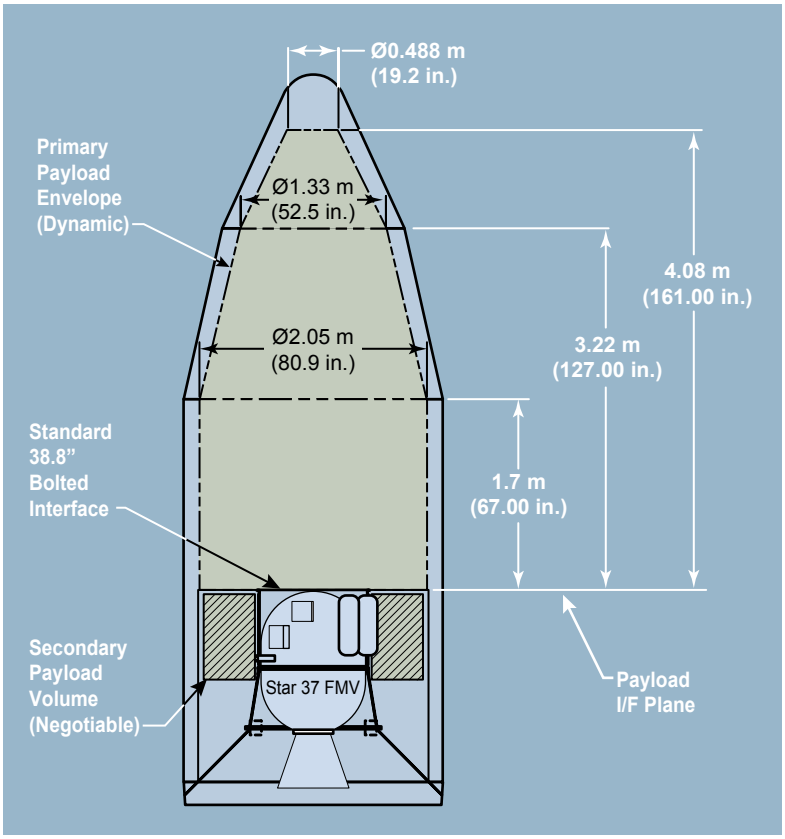
System Features

- Near term cost effective support of high energy trajectory missions
- Straight forward five stage evolution of Minotaur IV SLV
- Extensive use of flight-proven boosters, subsystems, and software
- Inertially-guided or spinning Stage 5 configuration options available
- Portable ground support systems allow multiple spaceport launch capability: (California, Florida, Alaska, Mid-Atlantic)
- Mission success ensured by mature systems and processes including Orbital's rigorous mission assurance program, full government insight, and independent assessment


92" Flight-Proven Taurus Fairing
Star 37FM or Star 37FMV
Flight-Proven Minotaur Avionics
New Stage 5 Structure for Minotaur V
Composite Minotaur IV Structure
Star 48V BV Stage 4
Unmodified PK Boosters (50+ Launches)
Proven Minotaur Heritage
Shared with Minotaur IV
Adapted from Flight -Proven Design for Minotaur V
Minotaur IV
Minotaur V

Minotaur V is a low risk direct evolution of Minotaur IV

Minotaur V



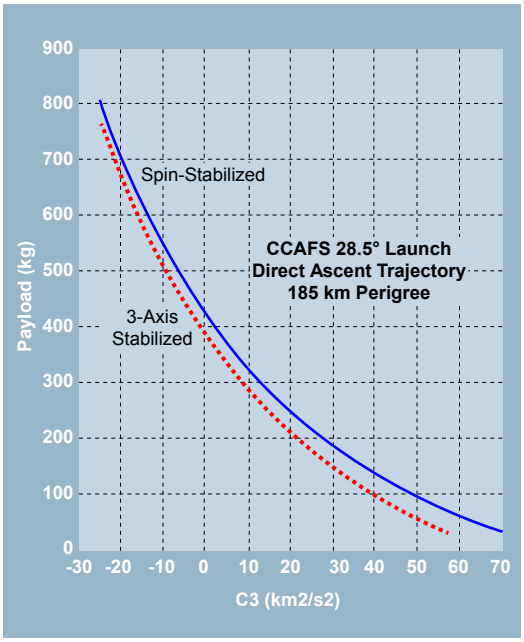
Standard 92" fairing envelope provides volume for a primary and multiple secondary spacecraft

Payload Accommodations

- Flight proven fairing shared with Minotaur IV and Taurus Heritage
- Attitude controlled or spinning final stage
- Well defined environments from extensive flight data and well characterized upper stages
- Class M6.5 (100k) to M5.5 (10k) cleanliness with temperature and humidity control
- Various flight-proven separation systems available, including low shock designs

Performance

- Spin-stabilized upper stage (Star 37FM):
  - GTO: 640 kg
  - TLI: 447 kg
- 3-Axis stabilized upper stage (Star 37FMV):
  - GTO: 594 kg
  - TLI: 402 kg



Minotaur V performance enables low cost high energy missions

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